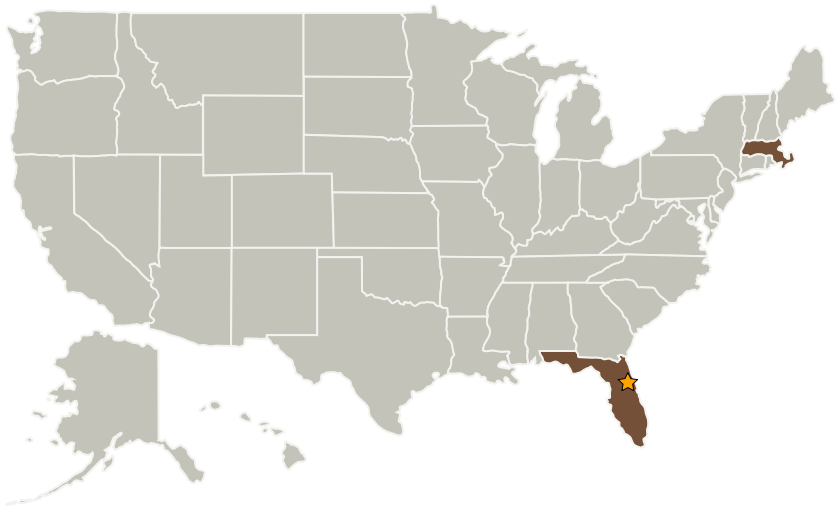
Electrochemical Carbon Dioxide Sensor for Plant Production Environments, Phase II

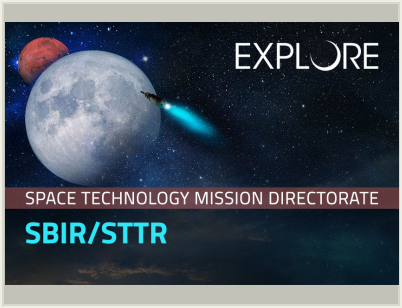
Completed Technology Project (2004 - 2006)

Project Introduction

The aim of this proposal is to develop a low power consuming solid polymer electrolyte based, miniaturized electrochemical CO2 sensor that can continuously, accurately and rapidly monitor CO2 for monitoring and control approaches of plant-production environments, to aid in NASA's biomass (edible food) production research. The proposed sensor will introduce a much simpler, lower cost and more accurate alternative to the existing infrared CO2 measurement technology to measure CO2 and study its effects on plant growth. During Phase I, in addition to concept feasibility demonstration, the ability of the proposed sensor to detect (0 - 10) % CO2 in a wide temperature (15 ? 45)degrees C, and humidity (10 ? 99) % RH was demonstrated. In Phase II the sensor will be integrated into a complete instrument and will undergo extensive testing for accuracy, specificity, longevity and statistical comparison to existing technology. The instrument will be small, lightweight and will allow for independent operation of the sensor complete with calibration routine, adjustable applied potential settings and digital display of numeric results. The unit will be battery operated with an AC converter and battery re-charger.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Kennedy Space Center (KSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Kennedy Space Center(KSC)	Lead Organization	NASA Center	Kennedy Space Center, Florida
Giner Electrochemical Systems, LLC	Supporting Organization	Industry	Newton, Massachusetts

Primary U.S. Work Locations	
Florida	Massachusetts

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Project Manager:

Frances Ann Patterson-hine

Principal Investigator:

Dharmalingam Ganesan

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.3 Human Health and Performance
    - TX06.3.4 Contact-less / Wearable Human Health and Performance Monitoring